King County's SciFYI

King County
Department of Natural Resources and Parks
Water and Land Resources Division

A digest of current natural science issues in King County | Article 0809-1 | September 2008

Swimming beach monitoring and health risks

By Jonathan Frodge, Ph.D., Senior Limnologist

Ever wonder who monitors the swimming beaches in King County for swimming health risks? The answer is King County's Science and Technical Support Section's Lakes Monitoring Program and the County's Environmental Laboratories. This program is jointly supported by Public Health–Seattle & King County and works in collaboration with several local agencies.

About 27 swimming beaches in King County are monitored during the summer. Monitoring determines levels of bacterial pollution (fecal coliform and E. coli) and the potential development of toxic algal blooms.

Fecal coliforms – what are they?

Fecal coliforms are a group of nasty intestinal bacteria. Fecal coliform and E. coli are types of bacteria normally found in the intestines of warm blooded animals, including humans, that are also present in fecal matter. They can indicate sewage pollution in water and a risk to human health.

Studies of recreational swimming waters have shown a link between several swimming-associated sicknesses and various microbial indicators or pathogens such as E. coli.

Fecal coliform bacteria are used to detect the possible presence of microbial contamination of water from human waste. Sewage pollution will result in high bacteria counts in water. However,

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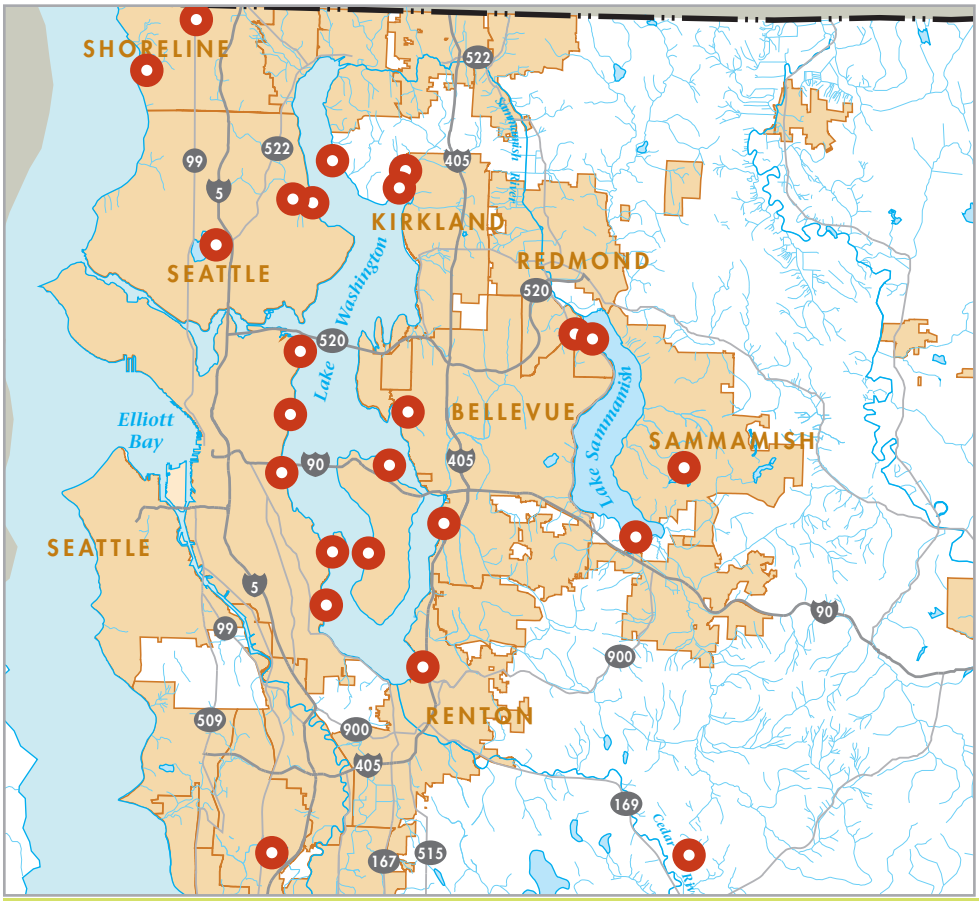
MONITORED SWIMMING BEACHES



- Andrews Bay - Seward Park
- Angle Lake Beach
- Echo Lake
- Gene Coulon
- Hidden Lake
- Idylwood Beach
- Idylwood Creek
- John's Creek
- Juanita Beach
- Juanita Creek
- Lake Sammamish Beach
- Lake Wilderness Beach
- Luther Burbank Beach
- Madison Park Beach
- Madrona Beach
- Magnuson Beach
- Magnuson Beach Off Leash Area
- Matthews Beach
- Meydenbauer Bay Beach
- Mount Baker Beach
- NE 130th Pl Newcastle Beach
- Pritchard Island Beach
- Rattlesnake Lake
- Thornton Creek
- West Green Lake

high bacteria counts do not necessarily indicate human sewage pollution because many other mammals and birds can also contribute this type of bacteria to the water. If the bacteria are from human sewage, tests for the presence of specific bacteria such as E. coli are used.

According to the state Water Quality Standards (WAC 173-201A-030), freshwaters that are rated AA (extraordinary) shall not have fecal coliform levels exceeding 50 colonies/100 mL and not have more than 10 percent of all samples exceeding 100 colonies/100 mL.

What is a cfu/100mL?

CFU is a unit of measure that stands for "Colony Forming Units." After incubation tests in sample dishes, bluish colonies of bacteria should appear. It is then necessary to count all of the colonies in each dish. A calculation must be done to determine the number of colony forming units per 100 milliliters of sample.

Low counts of fecal coliform bacteria – less than around 50 to 100 cfu – are routinely found in high quality water. Typical fecal coliform bacteria counts from the middle of lakes Washington and Sammamish during summer are less than 20 cfu.

Unfortunately, many of our urban streams in King County typically have counts of greater than 200 cfu/100 mL or higher under normal flow conditions. During storm events, these counts can exceed 1,000 cfu/100 mL.

About those numbers we use to evaluate the swimming beaches – they were adopted by the Environmental Protection Agency in 1976 and are used by the Washington State Department of Health. In scientific language, it is a geometric mean of less than 200 cfu/100 mL, 90 percent of samples less than 400 cfu/100 mL.

The Science and Technical Support Section's program also uses the criteria of all samples less then 1,000 cfu/100 mL.

Public Health– Seattle & King County determines the public health implications of the bacteria data collected from this program and conveys this information to elected officials and the public.

King County's Science and Technical Support Section and the Environmental Laboratories will continue working with local jurisdictions and Public Health–Seattle & King County to provide a safe and healthy beach experience for everyone.

For more information, visit
http://dnr.metrokc.gov/wlr/waterres/swimbeach/default.aspx ■

About King County's SciFYI

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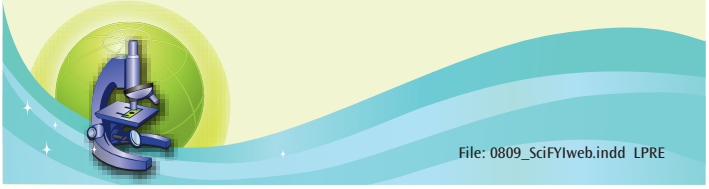

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